

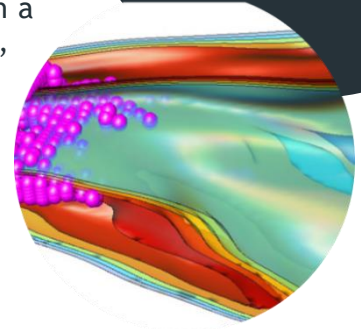
**University of Stuttgart**  
Germany

Department for Stochastic Simulation  
and Safety Research for Hydrosystems (LS<sup>3</sup>)

## Bayesian River Calibration

### M.Sc. Topic

Hydro-morphodynamic modelling has been considered as a powerful tool to assess the hydraulic regime and sediment transport processes in open flow system. River management and river engineering activities (e.g. constructing groynes, lowering the floodplain or dredging the main channel) should be reliable and help to control the transport of water and sediment through a river. However, flow in an open channel represents a complex process, where various physical parameters play a role and where many of them are uncertain, such as roughness coefficients or sediment grain sizes. In order to estimate these parameters, in hydro-morphodynamic models two options are available (1) collecting expensive field data for their parameters or (2) calibrating these parameters to available other data. The current master thesis proposes to investigate and adopt automated model calibration algorithms.



### Prospective Tasks

- Set up a test case scenario for hydro-morphodynamic simulation using a simple river model
- Identify an appropriate automated calibration algorithm that is efficient, robust and can include soft information into the calibration procedure
- Implement and test the identified calibration algorithm on the test scenario

### General Information

- Theoretic study
- Cooperation between *Department of Stochastic Simulation and Safety Research for Hydrosystems* at the University of Stuttgart and *Department of Hydraulic Engineering and Water Resources Management*
- Supervision by PD. Dr.-Ing. Sergey Oladyshkin, Dipl.-Ing. Felix Backers

### Desireable Skills

- Knowledge of river hydraulics
- Affinity to numerical simulations, statistics and programming (MATLAB)



**Apply now!**

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